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PHILOLOGY, OR THE SCIENCE OF ACTIVITIES DESIGNED FOR EXPRESSION

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INTRODUCTION

The fourth group of arts in the scheme hitherto presented in this journal consists of the languages which men devise to express their thoughts. Every art has its foundation in nature, for art arises through the attempt to improve on nature. Activity, as we have defined it, or self-activity as it is often called in psychology, is the primeval expression of animals by which their thoughts are interpreted by other animals. This primeval activital expression assumes a new phase under development, when it is known as the language of the emotions. In fact, primitive activital expression is the germ from which all other kinds of language are developed.

All nature is expressive, but activital nature is especially expressive of mind. Thus activities constitute a natural language expressing the minds of activital bodies, but such expression is not designed to be understood by others; it is therefore not conventional, and therefore not artificial. Natural expression must be distinguished from artificial expression or language, for natural expression is not designed to convey concepts, while

expressions which are designed to convey concepts constitute language. Hence language may be defined as the artificial expression of concepts in judgments by words in propositions.

Natural methods of activity are themselves indicative of thought which others may interpret, but when activities are conventionally produced for the purpose of expression and interpreted as such by others, language is produced. The producer of the speech implies the interpreter of the speech, and the two by custom come into a tacit agreement or understanding by which the language becomes artificial as conventional. So language may again be defined as an activital movement designed to convey thought to others.

It may be well to reëxamine briefly the nature of activital movement, although the subject has more elaborate treatment in my former work entitled *Truth and Error*. Movements in the animal body are performed by muscles. The muscles are found in opposing pairs, or more or less in opposing groups, which have the function of contracting and relaxing, and one may contract while the other relaxes and thus originate a movement in the animal body. The contraction and relaxation are produced through the agency of metabolism. When metabolism is constructive it is called anabolism, when it is destructive it is called catabolism. I suppose that catabolism produces contraction and that anabolism produces relaxation, but of this I am not sure. Certain it is that when muscles are contracted and relaxed, metabolism in both its methods is involved, so that all muscular action is founded on metabolic action, and metabolic action involves affinity, which is choice, as we have heretofore deductively demonstrated. The movements in animals which depend on muscular action due to the function of opposing muscles, one of which relaxes and the other contracts, we call activity. Activity is under the control of the will, for the individual animal controls activity indirectly by controlling the metabolism of molecules. It is thus that activity is innate in every living animal body.

EMOTIONAL LANGUAGE

The natural expression of strong emotion is cultivated by man in the earlier stages of society and likewise in childhood, so that an artificial language of the emotions is produced. Thus we have in laughter the language of joy, and in weeping the language of grief, each highly expressive of emotion.

To man who already uses language in its highly developed state, it may seem at first blush that laughter is a purely natural ebullition of joy, but on further examination he will see that it is no less artificial and conventional than the term joy itself; yet it is probably universal with mankind and is an expression inherited from his anthropoid ancestor. Those species nearest allied to this anthropopithecus indulge in laughter, and even squirrels chatter in a manner exceedingly suggestive of laughter.

Of what emotion laughter is the expression in its purely natural state we are left to conjecture. Let us assume, as seems probable from the little evidence we have, that it was the expression of joy, for it has this meaning with the species allied to anthropopithecus. Then came a time when laughing was conventional, as being designed for such expression that others who heard might understand it in this manner; then laughter became true language as we have defined it. Used at first with difficulty, it speedily became easy, and becoming easy it gradually became habitual, and finally instinctive by inheritance. The nature of this process can well be illustrated by citing the case of screaming, of which we will treat a little later. Even laughter is consciously used with designed expression, as when we laugh at things which are not amusing to us out of courtesy to others, when its original nature becomes apparent.

In treating of emotional expressions it will serve present purposes to speak only of one meaning for each expression; thus we speak of laughing as an expression or word of joy, but laughter, like all words in spoken or written language, has many meanings: in fact, emotional signs are especially characterized by multifarious

meanings; for this reason emotional language is highly ambiguous and a ready tool for deception.

Smiling as an expression of pleasure.—In smiling we have an expression of an emotion, less intense than that of joy, which may best be called pleasure. In laughter the muscles about the mouth, especially the risorius, are contracted, as also are the orbicular muscles about the eyelids. The group of muscles involved may be called the smiling muscles. The smile needs no further description. It expresses pleasure in a great variety of meanings, and it is clearly seen to be artificial, whether the approval be genuine or assumed.

“ I set it down

That one may smile, and smile, and be a villain.”

Weeping as an expression of grief.—In weeping tears flow and various muscles about the eyelids, especially the orbiculars, are involved, for through their agency tears are produced. The expression of sorrow is also found about the corners of the mouth which droop. All the muscles that take part in the expression, and there are many, may be called the muscles of grief. Those naturalists who are also psychologists explain the origin of weeping in the irritation to which the eyes are subject from smoke, dust, or other foreign particles and from scratches and blows. Primitive man seized upon this natural effect of discomfort to artificially produce weeping in order that he might express grief to others. Thus weeping became a linguistic sign, and a linguistic sign is a word in the generalized meaning of the term. Weeping is expressive of many emotions, hence the word has many meanings. Like all other signs of emotion it may be used in the practice of deception.

Sobbing as the expression of despair.—Sobbing is caused by sudden or spasmodic inspiration and is accompanied by the facial signs of grief through the action of the muscles of grief. Habit has made it instinctive, but its true nature as an artificial sign is plainly exhibited when sobbing is simulated.

Screaming as a sign of command.—Screaming is common to many of the lower animals, both mammals and brutes; it seems to be universally used by the young as a cry for help, and is thus subject to the will. In the human infant the instinct of screaming is exhibited before that of weeping. It is probable that all generations of human beings and generations of remote prehuman ancestry practiced the art. In the human being it is a cry or command for relief, and is so interpreted by every mother. Thus a cry has evolved into a word.

Bodily attitude as a sign of anger.—The emotion of anger, which is naturally expressed by striking, has many concomitants. In the infant it is accompanied by kicking and the general activity of the body which may be called squirming. This general activity causes a determination of blood to the head, so that the angry person becomes red. Another accompaniment of anger is the assumption of an attitude of belligerence, when the form is held erect, the hands are clenched as fists, and the arms held akimbo. With the adult striking and kicking are often inhibited, while there yet remain the attitude and the flushed face. This attitude is a true linguistic sign and hence a word. Sometimes the anger is expressed by simulated kicks, but usually this expression is one of contempt. Among some of the lower races the expression of striking is with the hands, for they are more accustomed to slapping than to fisticuffs.

Showing the teeth as a sign of rage.—Rage is a more intense anger, and to the sign of anger is added an additional element which is earlier than that sign. Brutes fight mainly with their teeth, and express their anger by showing their teeth, especially their canines; they also express anger by bodily attitude, and finally they express it as an artificial sign by erecting the hairs of the body, especially around the head and neck, thus causing a show of great size and strength. There remains with the more evolved man the sign-word of exposed teeth, in which the canines especially are displayed, as a habit inherited from the brute. It

is thus that the more intense anger which we call rage is artificially expressed by man in an exhibition of the teeth, and perhaps in grinding them together.

Compressing the lips as a sign of determination.—The compression of the lips as a word expressing determination or fixed purpose is universal among mankind. In origin it probably expressed the meaning, "there is no further word to be said." If so, its meaning has gradually changed. With this meaning it has become habitual and hereditary, so that the expression is made when the determination is made, without conscious intent to express this meaning to others, yet it is still used with this intent when we wish to simulate determination.

Frowning as a word of disapproval.—Disapproval is expressed by frowning which as a sign has become an artificial word. No word of emotional language is more common or more readily understood, and yet it is not devoid of ambiguity. It is expressed by the eyebrows through the corrugator muscles. But as these muscles are used in many other signs there is an element of uncertainty in its interpretation.

Many other activities are used for expression. We may mention a few more without discussing their origin. They are, averting the head as a word of disdain; shrugging the shoulders as a word of doubt, hesitancy, or helplessness; raising the eyebrows as a word of surprise; turning the eye without averting the head as a word of warning; beckoning to approach; beckoning to depart; beckoning to keep silence; beckoning not to move; nodding assent; shaking the head in negation, etc.

The principle of antithesis has been potent as an agency in the development of emotional language, as from its nature it is the expression of judgments about qualities. Qualities are always antithetic. This is one of the characteristics by which they are distinguished from properties and quantities. Darwin, in his *Emotions in Man and Animals*, abundantly demonstrates this principle.

In a subsequent article we shall attempt to demonstrate that the emotions are fundamentally and properly classified as feelings, enjoyments, affections, understandings, and sentiments.

ORAL LANGUAGE

One method of expressing emotional language has been developed as oral speech. The characteristics of this method peculiarly fit it for development in the first stages of human culture. The organs of speech can be used when the organs of locomotion and manipulation are otherwise employed. This characteristic serves a double purpose: it is advantageous to the maker of speech, and it is also advantageous to the interpreter. In visual language the interpreter must have his attention pre-adjusted thereto, while in order that it may serve his purpose the maker must also see that attention is paid. The conditions for conveying speech are superior in these respects to those for conveying visual language. Doubtless this advantage led to the development of speech in advance of the development of gesture language.

With the development of speech the organs with which it is produced were evolved until an apparatus was constructed capable of making with precision the differentiated sounds of speech and music, and of combining them into syllabic successions and the syllables into polysyllabic words. Doubtless the experience of very many generations was necessary to the production of the apparatus requisite thereto, and without doubt it can be affirmed that oral speech itself was developed in many of its essential characteristics during the process.

From study of the speech of birds we are led to conclude that the primitive speech of man was probably exclamatory, and that the first words were designed as warnings, calls, invitations to mates, and other simple expressions. To these were then added pronouns which served both demonstrative and personal functions. The *I*, the *you*, and the *he* probably subserved the purpose

of the *here*, the *there* of you, and the *there* of him, for which specialized cries were developed even as they are among the lower animals. Such cries may best be called exclamations; thus the exclamation is the first part of speech. It is a verb or word of the imperative mode in being an exclamation, and it is a noun in being a pronoun. In this stage parts of speech are undifferentiated, for every word served the purpose of all parts of speech. Refined distinctions of thought and refined distinctions of expression were not as yet.

From observations of child-language and from observations of bird-speech it seems probable that inflections or glides of the voice from higher to lower keys constitute the primitive method of differentiating the meanings of such words. Then perhaps adjectives of good and bad were developed, not as adjectives but as asserters of good and evil. They were thus verbs as adjectives and as asserters. Thus pronominal verbs and adjectival verbs may have been made ere the organs of speech were fully developed for the expression of well-differentiated sounds. Words of a simple character were made with undifferentiated meanings, of undifferentiated sounds, by undifferentiated organs. Thus far we may legitimately go, guided by the phenomena of bird-speech and child-language. To trace the evolution of oral language beyond this stage we must depend on vestigial phenomena.

To set forth the characteristics of oral speech it will be found advantageous to explain the evolution of its characteristics as found in the higher languages. For this purpose it becomes necessary to explicate the elements of oral speech. These elements are (1) sounds, which give rise to the science of phonics; (2) vocables or words, which give rise to the science of lexicology; (3) the use of words in sentences, which gives rise to the science of grammar; (4) the derivation of words one from another, which gives rise to the science of etymology; (5) the significance of words, which gives rise to the science of oral sematology.

PHONICS

The advantage which sound possessed over other elements of emotional language caused it to be much used and thus to be highly developed. In the process of this evolution special organs of speech were produced. Vocal speech thus became universal with mankind. In the passage of air through the throat by inhalation or expulsion, sounds are emitted by means of the vibration of the vocal chords, which sounds are made in great variety by lengthening or shortening the chords and by passing the air with greater or less force. Another class of sounds are produced by the modification of breathing with the lips, teeth, tongue, palate, and nostrils. The consonants may be classified in this manner.

With such a complex apparatus, subject to the will of the speaker, a great variety of consonantal and vowel sounds may be produced. In the practice of ages the undifferentiated sounds made by primeval man are gradually specialized. This specialization pertains more to the consonants than to the vowels. A peculiarity is found in these consonantal sounds, for in the different languages particular differentiations occur more or less characteristic of them severally, so that a language may often be distinguished by its consonants. One language may be remarkable for its development of labial sounds, another of dental sounds, another of lingual sounds, another of nasal sounds, another of palatal sounds.

Again, languages may vary in being more or less vocalic; that is, the speakers may resort more or less to the vocalic sounds as compared with the consonantal sounds. Again, there are certain sounds that are intermediate between vowels and consonants, and these may prevail to a greater or less degree in different languages. It is thus that the vocal apparatus of sound used to express speech in voice is capable of producing a great number of different sounds when we consider all the languages of mankind. On the other hand, when we consider the sounds of any particular language we find that only a limited number of

well-differentiated sounds are used. Perhaps two or three score of such well-differentiated sounds will be discovered. If for any language we wish to represent every sound by a distinct character, the problem is more easily solved because the number of sounds to be represented is thus restricted. Should we wish to represent all the sounds of all the languages by distinct characters, so that one character will stand for its special sound and no other, the problem is not so easily solved. The characters, then, are far more numerous.

Very much practice and great painstaking are required to discover the sounds of an unknown tongue. The speech of one man differs from another in the emission of sounds, even though they may have a common language. There are thus innumerable slight differences in the sounds produced in the same language by different persons, but habit interprets them according to a common standard which is established by vocal and written spelling. The habit thus formed of interpreting the sounds of the language to a conventional norm renders it very difficult to interpret the sounds of an unknown tongue. It is thus that students of the lower and unwritten languages use very different characters, because they interpret the sounds of such languages by assimilating them to the sounds with which they are more or less familiar; and there are instances in which the same person will interpret a sound as one thing and then another by its associations, and even in the same word the sound will have a double interpretation on different occasions or when used by different persons. There are certain characters used to represent sounds in which this liability to misinterpretation is common. Such are the sounds represented by *l* and *n*, the sounds represented by *p* and *b*, and even by *p*, *b*, and *w*. In one language related sounds may not be differentiated, and the synthetic sound produced will then be interpreted in varying ways. It is thus that the student of the phonics of many languages will always have a perplexing problem to solve.

Primitive languages are widely separated from one another. As they are now found they are already evolved into a high state of complexity and special sounds are developed in every one, for the centuries during which they have been spoken cannot be enumerated. Some languages are more highly evolved than others, but there is no reason to believe that one tongue has its roots more deeply embedded in antiquity than another. Surely no philologist would dare to affirm that the roots of one language are more ancient than those of another.

The philologist may compare a language as it is spoken now with the same language as it was spoken in some ancient time, and he may also compare a less developed language with the ancient stages of a more highly developed language. In doing this he may speak of a current language as if it were antique ; but we must understand by this not that he affirms greater antiquity for the language, but that he affirms for the methods of the lower language a state of evolution revealed in the ancient forms of a highly developed tongue.

LEXICOLOGY

I use the term lexicology to denote the science of vocables or words. The dictionary and the thesaurus illustrate two methods of assembling words for use. By one they are arranged alphabetically, by the other they are arranged classically with an alphabetic key. The science of words is pursued in both of these methods, and I call the study of words the science of lexicology. It will be seen that this science is well differentiated from the other sciences of language, although it cannot dispense with phonology, grammar, etymology, and sematology, for the elements of language are concomitant.

For dictionaries the alphabetic arrangement of words is not only convenient but necessary to their utilization. A classification of words by their meanings is a very difficult task which has never been accomplished in any perfect manner, and yet such

a classification, to which an alphabetic key is appended, is very useful to the scholar who is careful in the selection of his terms.

A vocable is a succession of sounds that are emitted in a prescribed order. This constant order by much repetition establishes a habit of emission which integrates the word and distinguishes it from other words. Thus an habitual succession of sounds constitutes a word. In sentences words are used also in succession, but the successions are variable and hence they do not integrate by habitual expression. In sentences the variability in the order of expression is an agency by which the sounds are prevented from coalescing; in words the invariability produces coalescence, so that we may define a word as a succession of coalescing sounds. The degree of coalescence is variable, and the degree of the separation of words in the emission is variable. Thus words may be of more than one syllable and yet the syllables be distinct in a minor degree, while the words of a sentence flow into each other so that one sentence may be distinguished from another, but the separation of words is more distinctly marked than the separation of syllables.

In the production of words from sounds idiosyncrasies prevail which are peculiar to the different languages severally. In one language certain sounds will not coalesce with certain other sounds to the extent necessary to the formation of a word, but one or the other of them will be modified. Facility in the combination of sounds into words is thus variable from language to language.

GRAMMAR

Grammar is the science of arranging words in the sentence. Sometimes it is called syntax. Grammar is held to include other of the elements of language; but we have already seen that the elements of language are concomitant, and one cannot be considered without implicating the other, and often overt affirmation is necessary. The word and the sentence may be identical units;

that is, a word may be a whole sentence. In some languages most sentences are but single words. In the examination of the many languages spoken by mankind they are found to differ from one another in the degree in which they construct monovocable sentences. It may be affirmed that the greater the prevalence of monovocable sentences the lower is the language in the scale of culture.

The characteristic which we have here described has been called by various terms, as synthesis, polysynthesis, or encapsulation—using as a figure of speech the inclosing of boxes, one within another, in the order of their size. Perhaps it will be better to use the term coined for the purpose by Lieber. He calls such languages “holophrastic”, and a word-sentence may be called a “holophrasm.” Bird-sentences seem to be holophrasms, while some bird-songs may be sentences composed of more than one word. In child-speech we discover that the first words spoken are sentences. We may thus conclude that the primal speech was holophrastic.

We must now set forth the manner in which speech is developed from the primitive holophrastic condition to that which has sometimes been called analytic, but which we will here call organic. The terms synthetic and analytic are misleading in that they implicate fallacies, hence we have selected the terms holophrastic and organic as they will better convey our meaning.

The organs of a sentence are the parts of speech of which it is composed. We must therefore deal with the parts of speech.

In words the office of assertion is fundamental. This office is often called predication. Attempts have been made from time to time to group the things which can be asserted or predicated, and they have been called predicaments. In that stage, which we have reason to believe to be universal in the lowest culture, all the offices of words are performed by one holophrasm. I say to an offender, “Go!” I mean by the expression, You, the offender, and I further mean to assert a command that he leave

my presence. All of these things are implied in the word *go*. The word *come* may thus be used. So we may use a great variety of imperative verbs. In like manner all adjectives may be used. In savage languages adjectives may be conjugated as verbs in the different voices, modes, tenses, numbers, and persons. We have in English many so-called verbs which are in fact adjectives used as verbs in this manner. Participles and adjectives are one in office; only difference in office constitutes different parts of speech. In all verbs the office of assertion still remains in the word. Words which still retain this office are called verbs, whether they express action or not; that which is essential to the part of speech which we call a verb is the office which it performs as an asserter. When the verb *to be* is used as an asserter it is a more fully differentiated verb. All other verbs are less differentiated, for they perform other offices in a greater degree. In the expression "I hear", *hear* is both an asserter and an adjective. The two offices may be differentiated by using two words, "I am hearing", *am* being the asserter and *hearing* the adjective. Even yet *am* is not a fully differentiated asserter, for *am* also conveys the idea of first person, singular number, and present tense.

The degree to which the offices of words are specialized is variable in different languages, and it is also variable in different ways of expression found in the same language. The verb often contains in itself the elements of the holophrasm which may or may not be repeated in the sentence when the verb is said to agree in such characteristic with its subject or even with its object, using these terms in their grammatical sense. This is a characteristic of the classical languages. Such tongues give duplicate expression to ideas, and hence require duplicate efforts of thought and expression.

The evolution of modern languages out of languages in which holophrastic methods prevail has as its essential motive economy of thought and speech. This is obtained by the atrophy of

methods of agreement. When number is expressed in the noun, in the adjective, and also in the verb or asserter, the number must be considered three times and expressed three times. The greatest economy is yet not all told. When such methods of expression are replaced by organic methods and only one word is used to express the number, it is found that in the vast majority of cases the purpose of the speaker is better accomplished by omitting to express the number. It is thus that in a perfectly developed organic language it is possible for the speaker to give his attention exclusively to the expression of the thought desired, and he need not detain the locution to consider and express multifarious inconsequent details. Why should a person in speaking of a ship be compelled to think of its number, its gender, and its case every time he uses the word, or the verb with it, or the adjective with it, when such particulars are of no consequence in the narrative?

The varying of forms of words to express particulars about the thing of which the word is a name is called inflection. The classical languages are thus highly inflected. The modern languages which have developed from the classical stage are more thoroughly organic. Yet men with linguistic superstitions mourn the degeneracy of English, German, and French without being aware of the great improvement which has been made in them as instruments for the expression of thought.

All words are names, and names are used in sentences for the purpose of making assertions. A sentence consists of a subject, an asserter, and an object. The subject is that of which something is asserted. The object is that which is asserted of the subject, and the asserter is that which predicates the object of the subject. In the science of language subject and object are terms used in a different sense from that in which they are used in psychology. Sometimes the sentence is said to be composed of subject and predicate, in which case the asserter and the object are considered as one; but this habit involves an error in the

discrimination of the offices of words. It is fundamental to the sentence that the three offices should be performed.

The offices of words in sentences, as distinguished from their meanings, are as subject, asserter, and object ; but as we call the asserter a verb we may say that the primary parts of speech are subject, verb, and object. Then there are subordinate parts of speech. The subject may be qualified, limited, or defined ; we shall call such subordinate words adjectives. The verb may also be qualified, limited, or defined ; that is, the assertion may be affirmative, negative, or conditional ; we shall call such words modals. Again, the object may be qualified, limited, or defined ; we shall call such words adverbs. Thus the six parts of speech are the subject, verb, object, adjective, modal, and adverb.

The grammars of the higher languages have hitherto been constructed on the theory that the classical languages were the proper standard of comparison, but in English certainly there is a tendency to construct grammar on the theory that the standard of comparison must recognize the subject, the asserter, and the object, which are then treated as defined or modified by subordinate elements. Already this change has made much progress, for practical teachers find that the elements of grammar when considered in this manner are far more simple and lend themselves better to intelligent instruction.

ETYMOLOGY

Etymology is the science of the derivation of vocables or spoken words. Human cries are probably the elements from which words are derived, and words have been evolved therefrom by the gradual differentiation of specialized sounds as the apparatus of speech has been developed.

That words may serve the purpose for which they are designed in expressing concepts they must be enunciated by the speaker and heard by the person addressed. In making and receiving the sounds of speech the persons who are in daily association

coöperate, so that the development of speech is a demotic process, for words must not only be spoken but heard, and they must be informed with thought if they convey thought. In tribal life, which is the earliest society, the tribe constitutes the body of persons by whom a language is developed.

We shall hereafter see that in this state an intertribal language is evolved which involves other methods of speech not produced by the vocal organs. This intertribal language is gesture speech. Gesture speech thus seems to be the normal language for intertribal communication so long as tribes remain distinct.

In the evolution of social groups one tribe coalesces with another. Some tribes develop their numbers to such an extent that they fall apart and no longer actively coöperate in the development of oral speech. The coalescing of distinct tribes or of fragments of distinct tribes is one of the great agencies in the evolution of language. Distinct tongues render mutual aid in the process. The language originating in this manner is compounded, and a wealth of synonyms is produced which readily take on specialized meanings highly advantageous, particularly to people who extend over a wide area of country in search of food or impelled by a desire for barter, and especially is it advantageous for tribes or portions of tribes that migrate to new habitats. In early society migration is a potent agency in the evolution of language. New scenes originate new thought, and new thought promotes new expression, and the new expressions are most readily learned from new tongues. It is thus that the vocables of a language are multiplied as synonyms by the coalescing of distinct languages, which words ultimately have specialized meanings.

This process has been continuous among mankind. Small tribes have become great tribes, and tribes have become nations, and nations have been absorbed by nations until the multitude of tongues spoken in savagery have been greatly reduced in number and the tongues spoken by the developed nations of civilization have become few in number. This is the grand factor in the

evolution of language, thoroughly attested by the history of civilization, while the tribes of savage and barbaric people are found with a much greater diversity of tongues.

New thoughts come with advancing culture. The words by which the new concepts are expressed may be new words from new languages, but often, and perhaps usually, the new thoughts are expressed by the old words. It is a slow process by which the new thoughts are expressed by differentiated words derived from distinct tongues. When new meanings are desired, some modification of the old words is made. In this manner one word is derived from another. Languages integrate by coalescing and differentiate words as parts of speech by derivation.

With advancing thought new concepts arise. For these new concepts new words may be coined, or the synonyms of coalescing languages may be used; but the usual method is to use an old word with a new meaning: this leads to duplicate meanings of words. In every language words have many meanings. If the words of the English language were multiplied so that one word should have but one meaning, and if synonymous words were reduced so that one meaning should be expressed only by one word, still the number of words in the language would be multiplied several fold. Duplicate meanings give rise to ambiguities, for the speaker may use a word with one meaning and the hearer may interpret it with another. There is a mechanical habit of using words by which many fallacies are produced in logic. That pseudo-science which is known as formal logic is provocative of these fallacies, for formal logic is a system of reasoning with words rather than with things. When we remember the number of distinct meanings with which words are conventionally endowed, it is not surprising that such fallacies should spring up; but it is surprising that they should be used from generation to generation and from century to century, so that fallacies of antiquity should still survive.

The rules for deriving one word from another differ in the

different languages, but the method of deriving one word from another is universal. There is a mnemonic advantage in knowing the derivation of a word. Wishing to express ideas, the words are more easily recalled for deft expression through the laws of association, and words which are unfamiliar may be recognized by recognizing the elements of which they are compounded.

In the early history of the European nations the literature of Hellas and of Rome played an important part in human culture, for the Latin and Greek languages were the repositories of the thought to which scholarly men most resorted, and learning itself was dependent on these languages; so that learning was often considered as the acquisition of the language rather than as the knowledge of the thought contained in the literature of the language.

In the derivation of new terms with the progress of culture, resort was had to these classical languages for the new terms which were needed, and scholars developed a system of rules which were expressed or implied as regulations for the derivation of new words. One of these rules was a prohibition upon the compounding of words from the elements of two languages; thus Greek and Latin elements should not be compounded in one word. As many of our words are not immediately derived from Greek or from Latin, the same rule was sought to be enforced with them all, and the words not compounded with the authority of these conventions were considered to be barbarous or unscholarly. Most new words are not produced by scholars, but by the common people in everyday speech, and thus a commonplace dialect is produced which scholars are ultimately forced to adopt in order that they may be popularly understood. Yet there is a sentiment, whether well-founded or not, against the coining of new terms from other tongues than the Latin and the Greek, and against the mixture of different linguistic roots. Sometimes these conditions are carried so far that the new term must be made according to the methods practiced in the Greek or the Latin at some particular time in the history of those languages.

Comparing those languages which exhibit the most highly differentiated parts of speech with the languages of savagery, we are able to discover the course of evolution in the past, and we may with some confidence predict their further evolution and even surmise the outcome—that is, the nature of the ideal language to which all languages are tending. The vast integration of tongues which has already been accomplished tells of a time when there will be but one human language as oral speech, and the state which will be reached in the specialization of parts of speech may be stated as a surmise in the following way:

There will be primary and secondary parts of speech. The primary parts of speech will be the subject, the verb, and the object, which will be distinguished as words. The secondary elements will be definers. The definers of the subject will be adjectives, which will be words, phrases, or subordinate sentences. There will be modals to define the asserters for the purpose of distinguishing affirmation and negation and all conditional modes of assertion; these modals will be words, phrases, or sentences. There will be adverbs to define the objects; these also will be words, phrases, and sentences. We may conjecture that to such a stage the parts of speech will be differentiated, guided by the motive for economy in thought and expression.

SEMATOLOGY

Sematology is the science of the signification of oral words and sentences. In considering this subject it becomes necessary not only to consider the significance of words, but also the development of the significance. "Words are signs of ideas," or, as we say, words are signs of concepts. It is fundamental that we recognize bodies as such by their properties, and cognize properties as good or evil for our purposes as qualities. The nascent mind speedily learns by experience that different properties inhere in the same body. The mind thus posits or implicates the existence of one property when it cognizes another. The bodies of

the world are cognized by the use of the five senses, every one of which primarily deals with a special property. The senses in highly developed man, though fundamentally devoted to a distinct property, have become highly vicarious, so that one sense seems to cognize all of the properties. The origin of this vicarious action of the senses is founded on the concomitancy of properties, for in cognizing a property we recognize other properties. In the developed mind every act of cognition is also an act of recognition; it is an act of cognizing one property and of recognizing others. This may be stated in another way: When we cognize a property we implicate the existence of other properties. All this has been set forth in another volume, but it requires restating here that we may properly understand how the meanings of words are produced.

The first words were calls, then came demonstratives, then adjectives of quality followed. Things were called by such names as "the sweet", "the bitter", "the high", "the low", "the fierce", "the gentle"—so the qualities were parceled out to things as their names. Researches in the etymology of the lower languages to discover the roots of words seem to lead to this conclusion. Not only were bodies named by their qualities, but properties also were named by their qualities. As gradually the qualities of things were discovered, quality names were differentiated; then property names were differentiated, and then the names of bodies themselves were differentiated. In savagery every property is known as a quality and is called by a quality name. Even the sunset is read as a beautiful color in the hue of rejoicing instead of as a hue in the rate of vibration revealed in the spectrum of light. Properties are known as qualities in savagery. As various properties are found in the same body, the names by which they are called may stand for the body itself. Thus every body may have a variety of names depending on its properties conceived as qualities. The discovery of this characteristic is the first contribution made to the science of language

through the study of ethnic or tribal languages. Max Müller, with characteristic deftness and scholarship, was, so far as I know, the first to clearly propound this doctrine. He seems to have derived it from a study of the appellations of the deities. Surely it was Max Müller who caused it to be accepted as a law of philological science. The same deity could be invoked by many names, and could be praised in varied speech; and when another god is addressed, many of the same terms can be employed. The substrate of this custom is found in the concomitancy of qualities and properties. Every god in savagery is the wisest and the best betimes, and every god has superlative attributes. The evolution of the meanings of words must first be considered as a development in knowledge by the discovery of new qualities, and new properties must be considered as qualities due to their concomitancy.

In primitive society the discovery of new bodies is ever in progress by a law of mind. As they are discovered they are affiliated to those already known and described in terms of the known. When experience finds it desirable to discriminate, the terms of expression are gradually differentiated, and thus new methods of speech arise. In savage society the tendency is to produce a holophrasm by modifying the old. As a linguistic phenomenon, classification is thus an agency for the development of speech. By classification the same body may have different names. Thus, while the same body may have different names by reason of its different properties, it may also have different names by reason of the different classes to which it belongs in the hierarchy of classes. In this manner names are greatly multiplied. Again, by evolving culture, things previously utilized come to be used and are given names which also signify their uses, so that names are multiplied by utilization. Meanings undergo corresponding evolution; the impulse for different meanings becomes the impulse for different names. This is general; the purpose gives rise to the expression.

The confusion which arises from the failure to distinguish consciousness from cognition, or the workings of the mind due to the organization of the nervous system from the substrate of mind as exhibited in all bodies even without organization, led to the theory of ghosts. This theory, which has also been called animism, induced savage men to personify all bodies. The personification in savagery was developed into similitude which is fully evolved in barbarism. In this stage of society a multitude of similitudes are found which in a later stage give rise to allegory, a variety of which is parable, and finally allegory is developed into trope. The meanings of words are multiplied by this agency, for the same word may have different tropic meanings, or, as it is often expressed, words may have figurate meanings. The giving of words figurate meanings is founded on the concomitancy of properties, and is developed in a multitude of ways all through the course of culture until it appears in the highly developed language as trope.

Here we may pause to note the fallacies of reasoning which are developed by the figurate meaning of words—fallacies so subtle that, although discovered by the ancient philosophers, who failed not to give their warning, they have yet been the bane of logic exemplified in all metaphysical literature. *Form* is the Anglo-Saxon term by which internal structure is designated, but as the internal structure gives rise to the external shape, both structure and shape are expressed by the term *form*. A spoken word is a succession of sounds. By a figure of speech we speak of the spoken word as a *form*, meaning thereby a succession which is an element of time, not of space. This usage is convenient, but it must be carefully distinguished when we reason, for the confusion which arises when a time succession is confounded with a spacial series is such a fallacy in science as to be disastrous. In psychology contiguity in time and contiguity in space are often confounded as one principle, especially in discussing the laws of memory.

The term *form* is sometimes used with a figurative meaning in other ways, as when we say "the *form* of an argument," meaning thereby the *constitution* of an argument, or the order in which the averments occur. In this sense every argument has a form; but it is not the form of space — it is the form of succession or time. When the argument is committed to writing, the letters may have forms as the sounds have succession; but the letters not only have forms, they also have successions. In the same manner written sentences have forms as well as successions. In this fact there is another source of obscurity in the use of the term *form*. Rightly understood it is proper, but if neglected it is a source of fallacy. In philosophy it is better to use the term *form* only to express structure and shape as they are found in space.

The story of the confusion of meanings in the use of the term *form* is yet but imperfectly told, for there are many derivatives of the word, as *formation* and *formative*. We may use the verb *to form* in any of the senses of "to make", "to produce", or "to generate." Sometimes we may be considering only the spacial form, but when we are considering some other topic the word is used in a sense which may give rise to confusion. I may combine oxygen and hydrogen and produce water, and I may say that oxygen and hydrogen *form* water, when I mean that they produce water, or that the combination of the two substances results in water. The use of the term in this manner serves a convenience and rarely leads to misapprehension; but when in science we use the term *form* out of its spacial significance, philosophy is apt to degenerate into metaphysic.

We might go on to set forth the use of *form* and its derivatives in other senses than that of spacial form, and still the subject would not be exhausted — not even in a great tome. Words in English derived from languages other than the Anglo-Saxon are subject to the same confusion of meaning. Morphology is the science of form, and yet the term is used as the name of a journal which deals mainly with the genesis and evolution of plants and

animals of which the forms of plants and animals constitute but a comparatively insignificant part, for the journal is devoted mainly to the genesis of function. Metamorphosis is used not only to signify change of form, but also the change of all other properties.

This habit of using words with figurative meanings leads to bad reasoning. Spencer, in the first volume of *The Principles of Ethics*, presents a masterly chapter on the relativity of pains and pleasures. Here, in the use of the term *absolute*, he distinguishes it from the relative by properly implying that what is relative must also be absolute. The same act is absolute as an act, though relative in its consequences.

Subsequently in his work Spencer sometimes uses *absolute* in another sense. Thus he speaks of "absolute ethics", meaning thereby conduct perfectly or superlatively ethical, and he uses the term "relatively ethical" to mean imperfectly ethical. No harm would be done by the use of the words in this manner did he not use a doctrine which he had previously developed about the absolute and the relative in ethics, as if he had demonstrated the same doctrine about the perfect and the imperfect in ethics; hence his consideration of perfect and imperfect ethics is vitiated.

Please permit the expression of an opinion about the origin of a fundamental fallacy in Spencer's *Principles of Ethics*: He fails to discover the true nature of ethics and its origin in religion, primarily by the failure to discriminate between perfect and imperfect on the one hand, and absolute and relative on the other; hence he confounds ethics with justice. The principles of justice are evolved under the sanctions of legal punishment, while the principles of ethics are evolved under the sanctions of conscience. Of course a discrimination of words must follow upon the discrimination of meanings, but the habit of using words with different meanings is apt to prevent the proper evolution of concepts.

Knowledge increases by the discovery of new bodies, new properties, and qualities. As new concepts are added in this manner, new methods of expression must be coined. The first

method is by asserting the existence of the new thing; after a time the new thing is given a name. It is the habit of modern science to give this new name at the time of the discovery, but in work-a-day life this is not common, and a name must be developed by experience.

We have next to describe a method of developing the meanings of words which has not only been universal but also has been very efficient. This method has been called a "disease of language". When a fog settles over the coast, it may sometimes be seen as a cloud of moving vapor; at other times to descend as fine drops of rain, when it is described as a "long-stemmed" mist by seafaring folk. In the same manner I have heard the shower which is composed of very large drops of rain to be described as a "long-stemmed" storm. Let this method of expression become habitual to a people, and the term *long-stemmed* will become an adjective descriptive of storms. Then the different words will coalesce and drop some of their sounds, and there will be an adjective descriptive of storms as "long-stemmed". Again, a storm of rain may be called a "long-stem", and the connotive meaning may be lost and the denotive meaning remain in common comprehension. I have known sailors to speak of a storm as a "long-stem". It is reasonable to suppose that the term *long-stem* might be used in this manner: As we may say of a man who is characterized by his fits of anger that he is a "storm", so we might say of such a man that he is a "long-stem", until an angry man might habitually be called a "long-stem". The "disease of language", as it has been called, is thus the specialization of sentences into words and the use of connotive terms as denotive terms.

Literary men are forever giving new meanings to old words. Lang, in the first volume of *Myth, Ritual, and Religion*, says, "It is 'a far cry' from Australia to the West Coast of Africa." We have only to suppose that the term *cry* becomes a measure of distance as the term *foot* was developed, and that the term be

used only in this sense, while other synonyms are used in what is now the ordinary sense, and we have a fine illustration of this phenomenon.

What has been called a "disease of language" is the substitution of a word to express a new meaning and the atrophy of the old meaning.

The Aryan Problem

In the study of the languages of the earth we find in a general way that the more primitive the culture of the people the fewer are the people who speak a common tongue and the greater are the number of distinct tongues. By a world-wide review of this subject we reach the conclusion that every tribe in the beginnings of human speech spoke a distinct language.

We cannot pause to completely assemble the data on which this conclusion is founded, but it seems that a language as an art of expression was originally developed by every distinct body politic. The persons who habitually associated as a body of kindred developed a language for themselves. Thus in thought we have to view an ancient condition of languages when every tribe had a tongue of its own and hence that the number of languages was approximately equal to the number of tribes. Languages thus commenced as a babel of tongues.

If we investigate the modern development of any one of the languages of higher civilization we find its elements to be compounded of many diverse tongues. What we know by historical evidence we are compelled to infer as true of all existing languages, and in fact no language—not even that of the most savage tribe—can be intelligently studied without discovering evidence of its compound character.

We must now call attention to the process of evolution of languages in which they are integrated—that is, they are forever becoming fewer in number. They do not multiply by evolution; they integrate. With this process of evolution, languages forever differentiate more thoroughly specialized tongues; they also dif-

ferentiate more thoroughly specialized parts of speech, and they also integrate and differentiate meanings. The process of evolution in language, therefore, is the integration of distinct languages and the differentiation of more specialized elements.

Many of the nations of Europe and America speak languages which are held to be cognate, and thus most of the more highly developed languages of the earth are said to belong to one family. These tongues are called Aryan. Linguists have devoted great labor and profound scholarship to the task of discovering a primitive Aryan speech on the theory that this supposed ancient common speech has been differentiated into the tongues of the Aryan nation, the theory being that of a single people inhabiting some limited locality in Europe or Asia. Opinions that were held of the degeneration of mankind gave rise to the theory, and scholars began the research by assuming degeneracy of speech, and by assuming the multiplication of tongues with the lapse of time. Research which has been pursued with so much labor and learning has failed to discover either the land or the people, but has forever resulted in the discovery of more and more diverse elements in the speech of the Aryan nation until few scientific linguists remain to speak of the separation of the Aryan tongues.

The course of history has been continuous in the integration of languages, and no language can be found at the present time that is not a compound. In this compounding of languages many tongues of today have common elements, and the higher the language the more diverse are the elements that have been incorporated. Yet men will still seek to solve the Aryan problem!

GESTURE LANGUAGE

Gesture language, like oral language, has its foundation in natural expression and emotional language. In the earlier history of speech it was ancillary thereto, and yet as language it remained more rudimentary and hence it retained more of the

characteristics of natural expression. As tribes developed speech independently, every one for itself, gesture language, which still retained many of the characteristics of natural language, became a means of communication between tribes having diverse tongues. The gestures themselves, though remaining largely natural, gradually became somewhat developed conventionally. Notwithstanding these artificial elements, gesture language in all history has been characterized by great crudity, and it largely resembles emotional language because both of them are akin to natural language. The gesture language which is found in tribal society was replaced by written language, as we shall hereafter show ; but new gesture languages have from time to time been devised for use by those unfortunate people who have been born deaf or who have by disease been rendered deaf. Therefore the nature of gesture speech is learned from the study of two distinct examples—the languages of intertribal society on one hand, and the modern languages of deaf-mutes.

While intertribal languages are founded on natural expression, and while some of the deaf-mute languages also are founded on natural expression, others of the latter have a more highly artificial or conventional structure. When the sounds of spoken words are represented by manual signs, or the letters of the alphabet are represented by finger-wrought signs, then gesture language itself consists of signs for signs and the vocal signs themselves standing for concepts. This form of gesture speech is therefore very highly conventional.

It is not consonant with our present purpose to further enlarge on this topic ; it is necessary only for us to mention gesture language as one of the pentalogic series that the complete series may be exhibited.

WRITTEN LANGUAGES

Modern written languages differ from speech in that sounds are represented by letters. Letters, therefore, are signs for

signs. When we study the history of the origin and growth of written language we find that it does not always use the method of representing sounds by written characters. In the Chinese, for example, the written characters have no reference to sounds as sounds are analyzed in phonics. Thus the Chinese have no alphabet. When we come to investigate the origin of alphabets we are led into a vast field of research in which we find that alphabets have a long history as picture-writings anterior to their development into alphabets. In tribal society all written language is picture-writing, used mainly for religious purposes. The pristine picture-writing was a means of communication with the gods and a method of record necessary for the proper observance of religious ceremonies, and especially of the time when such ceremonies should be performed. Thus the chief picture-writings of tribal society are calendric.

In the lower stages of society, when spiritual properties are held to live a distinct existence from the other properties of bodies, so that animism universally prevails, then ghosts are invoked for the purpose of gaining their assistance in the affairs of human life. The oldest differentiated calling in society is that of the shaman — a man who is supposed to have skill in communicating with ghosts. He who makes a profession of ability to communicate with ghosts is called in various languages by various terms that we now translate as *shaman* — a term derived from the early study of the Africans along the Guinea coast. The shaman is thus a man who claims to hold linguistic intercourse with ghosts. The shamanistic profession is practiced in every tribe, and it is through invention by shamans that picture-writing was devised, and it is further through their invention that picture-writing was developed into alphabetic writing.

It will be equally interesting and instructive to contemplate the origin of picture-writing. It is common in savage society to hold periodical festivals with fasting, feasting, music, dancing, dramatic performances, and athletic sports on the occasion of

making invocation for abundant harvests. There are many other occasions for like festivities with all their accompaniments. One example will suffice to set forth the nature of the picture-writing displayed on these occasions, and we will select for this purpose a calendric festival of rejoicing after the harvest-home which is also a prayer for future good harvests.

The festival to which I am now to refer was continued through several days. At one time the shaman and the members of the shamanistic society over which he presided were gathered in a kiva or underground assembly-hall where midnight prayers were made for abundant crops. On this occasion the customary altar was arranged with the paraphernalia of worship. Among other things were wooden tablets on which were painted the conventional picture-writings for clouds and lightning, below which were the conventional signs for raindrops, and below the raindrops the conventional signs for growing corn.

In order more fully to understand these picture-writings we will mention some of the other objects placed on the altar. There were wooden birds painted and placed on perches; there was a ewer of water about which ears of corn were placed; there was a case of jewels—crystals of quartz, fragments of turquoise, fragments of carnelian and small garnets;—then there was a bowl of honey upon the holy altar. When the shaman prayed he asked that the next harvest might be abundant like the last; he prayed that they might have corn of many colors like the corn upon the altar; he prayed that the corn might be ripened so as to be hard like the jewels upon the altar; he prayed that the corn might be sweet like the honey upon the altar; he prayed that the corn might be abundant for men and birds, and that the birds might be glad, for the gods love the birds represented upon the altar as he loved men. Then he prayed that clouds would form like the clouds represented upon the altar, and that the clouds would flash lightning like the lightning on the altar, and that the clouds would rain showers like the showers represented on the altar, and

that the showers would fall upon the growing corn like the corn upon the altar—so that men and birds and all living things would rejoice.

In savagery and in all barbarism such festivals are very common, and much of the time is occupied in worship. In savagery worship is terpsichorean, and in barbarism it is terpsichorean and sacrificial, and in both stages of society all amusements are religious. So in tribal society all time devoted to amusement is religious. These ceremonial festivals are held in regular order through the seasons from year to year. For this purpose a calendar is devised in weeks and months, when the days of the year are numbered in a hierarchy of weeks and months. The number of weeks in a month and the number of months in a year vary greatly. The months and years are counted off and the seasons are indicated by the appearance of stars as signs of the zodiac. Now, these numbers, together with the signs of the zodiac, are arranged in calendars, and the principal events of each festival are recorded under the calendric signs or picture-writings. Great ingenuity is needed to symbolize the principal events of the festival. The season of the festival and the events of the festival are all recorded in picture-writings until the shaman becomes deft in picture language. The records which have been discovered among tribal men are usually called codices. They are recorded on various things, such as papyrus, fiber of the maguey plant, birch-bark, and the skins of animals; especially are calendars painted on the walls of temples.

These records made from time to time through century after century become very highly developed. When a concept is given a sign it becomes more and more conventionalized until its character as a picture is lost. In this stage a curious phenomenon is observed. An ideoglyph is read as a word instead of as a pictorial event. This is the stage in which Chinese writing is to be seen at present. Now, when a glyph is read as a word, the interesting phenomenon of which we have spoken is this: Words

have different meanings, the same word may express different concepts, and the glyph may be read by speaking the word and attaching to it any meaning which the spoken word represents. In this early society words are mysterious things supposed to be properties or qualities of things, rather than signs of things. When such glyphs become signs of spoken words they are signs of sounds. They become signs of word-sounds, then signs of syllabic sounds, and ultimately signs of alphabetic sounds; and thus picture-writing is developed into alphabetic writing.

In the higher civilization written language is founded on alphabets as spoken language is founded on sounds; but primitive written languages are not graphic signs designed to represent sounds. The languages thus produced in primitive time have distinct words as ideographs; they also have a distinct grammar for the arrangement of these glyphic words unlike that of highly developed written language. Etymologies also take a different course; thus, in the Chinese, the etymology of glyph words is highly complex and is upon a distinct and peculiar plan. The sematology of the language represents the culture of the people who employ such a written language. On the other hand, in fully developed written language alphabets represent sounds, while letters are arranged in words and the words in sentences. The etymologies of the written words correspond to the etymologies of the spoken words, while the sematologies of the written words also correspond to the sematologies of the spoken words.

LOGISTIC LANGUAGE

The fifth language of the series now requires characterization. In the earliest and best developed condition it is found as the language of enumeration. Here numbers are represented by graphic characters which have been called digits, because originally the fingers of the two hands were used as an abacus for counting, and the written numbers represented the fingers—the nine vertical strokes for nine fingers and a cross stroke for the

tenth. Ultimately the ten strokes were developed into ten figures which are still called digits; the tenth digit is called a cipher, and in order that it may be significant it must be read as ten times some other digit; thus one with the zero is read as ten, two with the zero is read as twenty, etc. A hundred is represented with a one and two ciphers, two hundred by a two and two ciphers. Hence units of different orders are recognized. A constant ratio exists between one order and its next higher, which is ten, because the original abacus for counting was the ten fingers. As this linguistic system had its beginning in a number system, we call it logistic speech. There have been developed many tables of measures for quantities of various kinds; thus there are the long-measure table, the square-measure table, the cubic-measure table, the dry-measure table, the liquid-measure table, various weight-measure tables, various time-measure tables, etc. These are all examples of logistic speech, which were developed out of ideographic writing into a language of more universal application.

The highest development of this language which yet exists is found in the science of mathematics, which has a plus sign, a minus sign, a multiplication sign, a division sign, an equality sign, a root sign, and many others;—we will not go on to enumerate them because they are many and so well known that the few will suggest them all. The science of astronomy has also developed an elaborate logistic language, the science of chemistry another, and the science of geography, the science of geology, the science of botany, and the science of zoölogy have all developed something of a logistic language. A logistic language is also developed in many of the arts; especially is music thus written.

The essential characteristic of logistic language is that its sematology is universal, so that the meaning of any character depends on the meaning assigned to it by the user—it is the special language of reasoning and avoids all ambiguities of other languages due to the multifarious meanings of single words. There is no source of error in reasoning which compares with the

fallacies of diverse meanings, but science constructs for itself a special language which obviates this evil.

The grammar of this language is yet unwritten, for the language has scarcely been developed to a sufficient extent for the purpose. It may be that when logic is wholly emancipated from metaphysic, logicians will devise a grammar of logistic language. Perhaps they will then call it the grammar of logic, and what I have called logistic language will be called logic. All that is valuable in the so-called logic will remain as component elements of a grammar—a grammar of the science of reasoning with language. Logic is the science of reasoning with language, and logistic language is the language of reasoning.

We have thus seen the nature of emotional language, oral language, gesture language, written language, and logistic language. The five fundamental sciences of Philology are thus briefly characterized, and the nature of Philology itself is set forth in its pentalogic elements, which I deem to be inclusive of all and severally exclusive of each other.